REMARKS

This paper is responsive to the Office Action dated January 23, 2006 (the "Office Action").

Claims 1-21 were previously pending in the application.

Claims 1, 12, and 21 have been amended.

No claims have been added or canceled in this paper.

Accordingly, claims 1-21 remain pending in the application.

Claims 1-21 stand rejected.

Claims 1-10, 12, and 16-21 stand rejected under 35 U.S.C. § 102(b) as being anticipated by F. S. Hillier and G. J. Lieberman, *Introduction to Operations Research*, 6th ed., McGraw-Hill, Inc., 1995 ("*Hillier*"). Claims 11 and 13-15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Hillier*. Applicant offers that the claims are allowable and respectfully requests reconsideration in view of the following remarks.

Rejections Under § 102(b)

Claims 1-10, 12, and 16-21 stand rejected under § 102(b) as being anticipated by *Hillier*. While not conceding that the Examiner's cited reference qualifies as prior art, but instead to expedite prosecution, Applicant has chosen respectfully to traverse the rejection as follows. Applicant reserves the right, for example in a continuing application, to establish that the Examiner's cited reference does not qualify as prior art as to an invention embodiment previously, currently, or subsequently claimed.

Applicant's claim 1 has been amended. Claim 1, as amended, is reproduced below.

1. A computer-implemented method comprising:
optimizing a multivariate representation of resources, wherein the resources are used in producing a set of products, and the resources, the set of products and their respective connectivities are represented in a product space plan, the optimizing comprising
converting a non-linear expected value function associated with the resources and products into a closed form expression;
transforming the product space plan into a working transformed space plan, wherein the products are transformed into working elements;
performing a loading step to form elemental blocks as a function of a single variable of the multivariate representation with elements being loaded with resources that gate production of the element;
examining the elemental blocks to determine if a first element has not been loaded with a corresponding first resource that gates production of the first element;
if the examining indicates that the first element has not been loaded with the first resource, performing a re-loading step to form elemental blocks as a function of a single variable of the multivariate representation with the first element being reloaded with the first resource;
solving for the maximum of each elemental block over each associated single variable of the multivariate representation, wherein the solving is performed by a computer; and
determining the optimum level of resources as a function of the solved for maximums.

As amended, claim 1 includes a limitation of **examining the elemental blocks to determine if a first element has not been loaded with a corresponding first resource that gates production of the first element**. This limitation is not disclosed in the cited art.

In various implementations of the invention, the examining of the elemental blocks may be performed after an initial loading of the elemental blocks. Depending on the implementation of the method and on the various conditions being optimized, the initial loading may fail to associate a particular resource with a product that is gated or limited by that resource. An examination of the initial loading may be used to detect this failure, so that the initial loading can be modified appropriately.

The examining in claim 1 may be used, for example, in certain embodiments of the invention to address situations in which two components may be shared by two or more products. The examination may be used to identify situations in which elements have not been initially loaded with the appropriate gating components, so that a subsequent reloading may be performed as needed in various implementations of the invention. See, e.g., Specification at 24, lines 2-4 and 7-13.

With the above limitation, claim 1 indicates an additional distinction between Applicant's invention and the cited art. While *Hillier* discusses the optimization of nonlinear multivariate problems, *Hillier* does not teach the technique of examining an initial loading of elemental blocks so that the blocks may be re-loaded. Such an examining is not present in the cited art.

Based on this examining, a reloading may be performed as needed. As amended, claim 1 also includes, **if the examining indicates that the first element has not been loaded with the first resource, performing a re-loading step to form elemental blocks as a function of a single variable of the multivariate representation with the first element being reloaded with the first resource.**

This limitation is also not disclosed in Hillier. Hillier does not teach the conditional reloading of elements based on an examination of elemental blocks.

Further, Applicant respectfully submits that other limitations are also not disclosed in the cited art. For example, claim 1 includes **performing a loading step to form elemental blocks as a function of a single variable of the multivariate representation**.

The Office Action states that this limitation is taught on pages 564-65 of *Hillier*. Applicant respectfully disagrees. The cited portion of Hillier presents analyses of situations that are represented by multiple variables: these passages do not describe single variable situations. On page 564, *Hillier* presents equations in which outcomes depend on two different variables: x_1 and x_2. On page 565, *Hillier* illustrates a point using single-variable calculus (that $d^2f/dx^2 \leq 0$ may be used as a condition for finding a global maximum of a doubly differentiable function). However, the single-variable illustration is not used in conjunction with the multivariable problem that is addressed by Hillier. In particular, *Hillier* does not decompose the multivariable problem into several separate single-variable problems. Hillier therefore does not suggest, teach, or describe the variable-by-variable technique set forth in Applicant's claim 1

At least for these reasons, independent claim 1 and all claims dependent therefrom are allowable under § 102(b). At least for similar reasons, independent claims 12 and 21 and all claims dependent therefrom are also allowable under § 102(b). Accordingly, Applicant respectfully requests that the pending rejections under § 102(b) to claims 1-10, 12, and 16-21 be withdrawn.

Rejections Under § 103(a)

Claims 11 and 13-15 stand rejected under § 103(a) as being unpatentable over *Hillier*. Regarding claims 11 and 15, the Office Action notes on page 10 that *Hillier* does not expressly disclose using an inverse Cholesky transformation. Regarding claims 13 and 14, the Office Action notes that *Hillier* does not expressly disclose using a multivariate demand distributions that is a member of the elliptical family of distributions or a multivariate normal distribution.

In support of the rejections, however, the Office Action argues that these claims are unpatentable under § 103(a) because these features may be well-known. Applicant respectfully disagrees.

While it may be stated that a certain function is well known, such a statement, even if true, cannot be extrapolated to imply that the function is or might be well suited for a particular task. The reasoning set forth in the Office Action would imply that practical formulations such as "$E=mc^2$" or "F=ma" should have been considered obvious when they were developed because they were composed of mathematical functions that were well-known at the time, e.g., multiplication and squaring (regardless, of course, of the patentability of such formulae). Moreover, by this reasoning, no electronic circuits that are made merely of resistors, capacitors, inductors, diodes, and transistors could be patentable, given that their components are so well known.

Applicant respectfully submits that the selection of a particular mathematical function for a particular task is not made obvious merely because the function is well known. In this case, the claims propose the use of particular mathematical formulations in conjunction with specific acts in the context of optimization problems as set forth by the limitations of the claims. The use of an inverse Cholesky transformation, a member of the elliptical family of distributions, or a multivariate normal distribution in the context of claims 11 and 13-15 is not made obvious merely because these mathematical formulations may themselves be previously known. Claims 11 and 13-15 are therefore allowable under § 103.

Additionally, Applicant reiterates the request under MPEP § 2144.03(C) (from the Applicant's Response to Final Office Action dated November 14, 2005) for a reference in support of the position that it would be obvious to use an inverse Cholesky transformation in

conjunction with the other limitations of claims 11 and 15. If it is the Examiner's position that the rejection is based on personal knowledge, Applicant again respectfully requests that the facts be supported by an affidavit or declaration from the Examiner.

Still further, claim 11 depends upon claim 1, and claims 13-15 depend upon claim 12. The reasoning presented above with regard to the rejections under § 102(b) apply with equal force to the rejections under claim 103(a). Accordingly, claims 11 and 13-15 are also allowable for the additional reason that these claims include limitations that are not present in the cited art. In view of these arguments, Applicant respectfully requests that the pending rejections under § 103 to claims 11 and 13-15 be withdrawn.

CONCLUSION

Applicant submits that all claims are now in condition for allowance, and an early notice to that effect is earnestly solicited. Nonetheless, should any issues remain that might be subject to resolution through a telephonic interview, the Examiner is requested to telephone the undersigned.

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Mail Stop AF, Commissioner for Patents, P. O. Box 1450, Alexandria, Virginia, 22313-1450, on January 24, 2006.

Attorney for Applicant — Date of Signature: 2006APR24

Respectfully submitted,

Cyrus F. Bharucha
Attorney for Applicant
Reg. No. 42,324
Telephone: (512) 439-5097
Facsimile: (512) 439-5099